

# RONALD E. McNAIR 2016



Summer Research Journal

**Volume 21**



The College at  
**BROCKPORT**  
STATE UNIVERSITY OF NEW YORK

**TRiO**  
RONALD E. McNAIR  
POST-BACCALAUREATE  
ACHIEVEMENT PROGRAM





# 2016 Ronald E. McNair Summer Research Journal Volume 21



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## About TRiO Programs

TRiO refers to six programs funded by Title IV of the Higher Education Act of 1965. The original TRiO Programs are Upward Bound, Talent Search, and Student Support Services. The name TRiO was retained even though more programs were added. The additional programs are Educational Opportunity Centers, the Ronald E. McNair Post-Baccalaureate Achievement Program, and a training program for TRiO staff. In general, TRiO programs are focused on providing educational opportunities to first-generation college students who come from low-income families and students with disabilities.

## About Ronald E. McNair

Ronald Erwin McNair was born on October 21, 1950, in Lake City, South Carolina. He attended North Carolina Agricultural and Technical State University, where he graduated magna cum laude in 1971 with a Bachelor of Science in physics. He continued his education at the Massachusetts Institute of Technology, earning his PhD in 1976, and went on to become a recognized expert in the field of laser technology with the Hughes Laboratory. In 1978, McNair realized his dream of becoming an astronaut; selected from a pool of 10,000 applicants for the space shuttle program, McNair became the

second African American to fly in space. After his death aboard the space shuttle Challenger in 1986, Congress approved funding for the Ronald E. McNair Post-Baccalaureate Achievement Program, which is dedicated to the support and promotion of the high standards of achievement exemplified by McNair. Those who knew McNair characterized him as fearless, determined, and accustomed to applying all available resources to any problem he faced.

## The McNair Program at The College at Brockport, State University of New York

Designed for first-generation and low-income students as well as students from groups underrepresented at the doctoral level, the Ronald E. McNair Post-Baccalaureate Achievement Program at The College at Brockport encourages talented students to pursue a doctoral degree. The program promotes graduate studies by providing participants with seminars and workshops germane to the pursuit of graduate education, a mentored summer research experience, and opportunities to present this research at professional conferences.

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## Introduction and Acknowledgements

### Barbara J. Thompson

Executive Director, TRiO and CSTEP Programs;  
Past-President, Association for Equality  
and Excellence in Education, Inc.

### Dear Readers:

I am pleased to introduce you to the 21st volume of the Ronald E. McNair Summer Research Journal. This journal is a compilation of the work our scholars complete each summer as they learn to conduct research in their chosen field. Under the guidance of dedicated faculty members, McNair scholars design and implement projects that teach them the fundamentals of creating and using knowledge and provide them with their first taste of the graduate and professional world they are preparing to enter. The Summer Research Program takes our students beyond the average undergraduate experience, setting them apart from their peers as it elevates their education to a level not usually available to students pursuing a bachelor's degree. I am sincerely grateful to the 40 faculty members who invest so much of themselves in moving our students forward. The expertise and encouragement they provide is critical to the success of our McNair scholars, not only during their undergraduate years, but most importantly when they enter the competitive world of graduate school. The fact that 283 of our 709 McNair alumni have successfully earned master's degrees, 26

professional degrees and 45 doctoral degrees is a tribute to the quality of the work our mentors expect and elicit from their students. Those involved in nurturing our future professionals in this manner deserve to be highly recommended. I look forward to seeing our scholars enter the ranks of academia and continue the process of personally investing in future generations, passing on what they have received through the dedication of our mentors, program staff, and campus community.

### Acknowledgements

The McNair staff would like to take this opportunity to thank Dr. Heidi Macpherson, Dr. Michael Fox, and Dr. Eileen Daniel who have assisted in strengthening our program this past year. While the Office of Academic Affairs administers the program, the support base represents a university-wide commitment to achieving our program goals. The US Department of Education, other TRiO Programs, the Research Foundation, and the entire institution collectively lend their efforts to the program's success.



## Management Perceptions on Social and Human Capital

**Charles Alford**

Business

**Mentor:** John Keiser, PhD

In business, managers judge employee performance partially based on social and human capital. Social capital is 'who you know' which is interdependent on trust, norm based values, and connectivity between interpersonal interactions in the world of business. Human capital is 'what you know;' it is the knowledge that is held by the individual within a company that has a diverse set of abilities to take on rigorous career paths. For example, a Chief Executive Officer (CEO) or Chief Financial Officer (CFO) would be expected to have a strong set of skills and knowledge to earn their position. The myth of business is "It's not about what you know, but it's about who you know." However, research shows that managers prefer a balance of both human and social capital in their employees. Employers have confidence in their employees for their social skills to gain trust of clients; also they must have the knowledge and expertise to maintain longevity within that business relationship. Managers' perceptions influence the actions and/or beliefs of employees as well as their emotions, motives and objective reasoning. In the workplace, managers will influence the performance of their employees, but those employees must have both sets of capital – social and human – in order to perform at the highest level for the company.

For my research, I analyzed three different areas. I analyzed the fundamentals of managers' perception of employees' social capital, human capital, and lastly performance. This required me

to research published sources such as *Business Insider*, *The Wall Street Journal*, *The New York Times* and others. This research showed me business managers' thoughts; whether they preferred social or human capital, and which affected their employees' performance. This was difficult to narrow down because there are so many different forms of business. Furthermore, performance can be measured differently across different departments within single businesses resulting in anomalies of performance measures. Creating homogeneity by focusing specifically on financial services companies, I was able to learn from published field studies, interviews, and statistical analysis that most managers wanted both social and human capital in their employees.

I was able to gather from my studies that most managers wanted the characteristics of decision making skills (human capital) and communication skills (social capital) from their employees. The managers' perception was that if the employees were able to communicate effectively and earn the trust of the client, then they perceived the employee had good decision making skills that kept their clients loyal. On a further note, from a manager's perspective, social and human capital are complementary assets. Managers' perception of human and social capital is "what food is for body." My presentation consolidates existing research on perceptions of workplace performance of employees in the financial services industry.



## Interludes of Black Consciousness as Exhibited in Ndebele's Short Story "Uncle"

Rachel Campbell

English

Mentor: Michael M. Boston, PhD

This study of black South African literature during Apartheid (a system of racial segregation in South Africa) shows how multiple writers such as Njabulo S. Ndebele, specifically in his collection of short stories *Fools and Other Stories*, clearly balance literature as a place of protest and creative outlet. In *Literature Police*, Peter McDonald stated that Ndebele's writing strives to be beyond protest and sets out to establish a literary space outside the structure of opposition (McDonald 388). This idea is confounding because to write outside of a space of oppression and protest is nearly impossible during Apartheid (whether they were white or Black South African), because the level of censorship and political climate did not allow such luxuries. In this close reading analysis of Ndebele's short story *Uncle*,

I found various interludes of black consciousness as established by Steve Biko's *I Write What I Like*. After researching black consciousness under the definition of Biko, the scholarship of Peter McDonald's *The Literature Police*, David Attwell's *Rewriting Modernity* and Ndebele's scholarship *Rediscovery of the Ordinary*, I found that Ndebele does not write outside of protest. The short story *Uncle* contains interludes of protest mainly expressed and influenced by Biko. Ndebele, in this narrative, alludes to a pan-African protest against Apartheid that is expressed through the artist. Ndebele produces works that speak in the language of the oppressed. Overall, South African literature, especially during Apartheid, cannot be separated from oppression and protest.



## Gender as Performance: Trans/Non-binary Visibility Through Self-Photography

**Sam Chudyk**

Sociology

Mentor: Elliot Weinger, PhD

This research is a qualitative content analysis project on “selfies” (self-photography) of transgender and non-binary identified individuals (individuals who do not accept the premise that gender identity and presentation are determined by biological sex). Trans and non-binary individuals are under-represented in sociological research.

In order to collect data I tracked selfie tags of transgender (individuals who are not cis-gender but still identify within the binary system as trans-man/trans-woman) and non-binary identified individuals (individuals who do not identify as a cisgender man, cisgender woman, trans-man, or trans-woman) on the social media site Tumblr from the past two years. All of this information was public and could be attained without “friending” individuals. I limited my sample to selfies that included preferred pronouns, commentary, and the individual’s face. I created my sample by randomly selecting 15 selfies from both the transgender and non-binary category. I then created a characteristic-index of 30 appearance-based traits to better analyze individual’s gender presentation.

My goal was to reconsider some classical sociological arguments pertaining to self-presentation in light of recent trends towards the loosening of gender constraints in the formation of online personal identity. As social media has flourished the selfie has become public, creating an opportunity to study how individuals see themselves and how they actively present themselves online in front of an audience.

Erving Goffman’s conceptualization of the “Presentation of Self” was the core theoretical framework for this research. Goffman states that all

public interactions are “performed” as if individuals are on a stage. Goffman further asserts that there are two distinct regions of this performance: the frontal stage (the area where the performance takes place in front of an audience) and the backstage (the area in where the performance is practiced and rehearsed; the construction of front stage). I anticipate that selfies of trans and non-binary individuals will challenge the notion of Goffman’s “frontal stage” and are more likely to present what Goffman considers the “backstage.” This is because trans and non-binary individuals have to be hyperaware of gender presentation if they hope to “pass.”

The data indicates that trans/non-binary selfies are simultaneously backstage and front stage. The selfie is the performance itself. A selfie is constructed for an audience, and therefore, by definition is to be considered a front stage depiction; we could also characterize this as “gender presentation.” However, a majority of these selfies contain themes about “passing,” the construction of appearance, the dangers of not “passing,” as well as discussions around construction of the performance (found in the comment section) that are distinctly unique to the backstage region. This backstage depiction could be characterized as “gender identity” while also including a comprehensive “trans-narrative” around individuals’ “gender expression and gender presentation.”

Moving forward, I’m invested in looking at how transgender and non-binary individuals face intuitional and systematic barriers, including education, bureaucratic redlining, and anti-trans policy.



## Black Male Education: A System of Failure

**Robert L. Darrisaw Jr.**

Social Work and Mathematics

**Mentor:** Trevor G. Gates, PhD

This project serves as an exploration of social and educational disparities among Black males in the United States. Research shows that Black males have the lowest levels of educational attainment, lower than any other race and gender combination. It is important to understand what factors contribute to the hindrance in educational attainment of this demographic, as well as systems and changes that can be put in place to help Black males succeed academically.

The procedure method used for this project was a qualitative research study based on the journals and articles provided from databases searches using key words such as "Black males and education system", and "Changing Black Education," including the work of Dr. Shaun Harper. I also researched the practice of school funding and the inequalities of school funding that are outlined in published text such as *Savage Inequalities* and *The Shame of the Nation* by Jonathan Kozol. Finally, I began to conduct a cross analysis of the three educational planes (Primary, Secondary, and Post-Secondary) and socioeconomic factors to understand how these factors affect the educational process of the Black male.

Socioeconomic and educational disparities and inequalities are significant factors in the educational

obtainment and educational gap of the Black male and his counterpart. Disparities in reading and math scores/level appear as early as the fourth grade and continue to grow as the black male continues through his schooling. One key inequality is the extreme differences in funding of urban schools, which is associated with poverty and with the environment of the Black male in comparison to suburban or white schools within the same state or area. Lower spending per pupil contributes to fewer resources and inadequate classroom materials. Black males are also expelled at higher rates than their white counterparts, and the black male as a subsystem of the black population is expelled at higher rates than the black female. A conclusion to be made is that the education system and socioeconomic factors of society are not in favor of the Black male to succeed academically. From primary to post-secondary education, there are many factors which hamper his educational success.

Recommendation in moving forward with this research topic would be to further study additional socioeconomic factors that affect the Black male paths of education. From the data collected, I anticipate proposing ways to decrease educational disparities for Black men.



## Is Your Zip Code a Death Sentence? A Neighborhood's Impact on Childhood Obesity

**Ann Marie Duprey**

Exercise Science and Biology

**Mentor:** Brooke Starkoff, PhD

Childhood obesity is one of many serious public health issues in our society today. Consequently, the current generation of children and adolescents are at increased risk for diseases such as cardiovascular disease and type 2 diabetes. This literature review examines the effects of a child's neighborhood on contributing to childhood obesity. Socioeconomic status, food security, and neighborhood safety are just a few of the causes of obesity that were explored in this study. Our research aims to answer the question: "How does a zip code impact nutrition and physical activity choices in children?"

This research focused on 'built environment,' the physical and social elements of a community that influence the nutrition and physical activity choices of those living in the area. Some of these physical elements include proximity to fast-food restaurants and convenience stores and presence of sidewalks and street lights. Some social elements of a community that may influence the choices of residents are perception of neighborhood safety and neighborhood social connections. Food security and access also impact obesity in children greatly. The literature demonstrates that living further from a grocery store and living close to fast-food and full service restaurants was associated with a higher BMI. It was shown that convenience stores had strong adverse effect on BMI, specifically in lower income neighborhoods.

Children living in more affluent neighborhoods reported healthier eating and more frequent exercise; exercise frequency was positively associated with neighborhood social ties. Children whose parents perceived their neighborhood to be

unsafe acquired more screen time and less physical activity. The positive correlation to snacking can also lead to an increased risk of obesity. Crimes which involve taking property but do not involve force or a threat to a victim were associated with higher BMI. On the contrary the presence of streetlights, sidewalks, and curb cuts were related to more physical activity in children; presence of these amenities in a neighborhood may increase feelings of security, making parents more comfortable having their child participating in activity in the neighborhood. It was also observed that a child's perception of how close a park was to them may have been more closely related to their use than just the proximity. Physical activity was significantly associated with a child's perception that they were close to a park, playground, or gyms.

This research demonstrated that healthy behavior is linked to 'built environment assets' such as perception of safe neighborhoods, access to parks, proximity of supermarkets, and social connections. Unhealthy behavior is linked to 'built environment inhibitors' such as access to fast-food restaurants, lack of safe places to play, and perception of the neighborhood. Those living closer to supermarkets have access to fruits and veggies decreasing their caloric intake. When neighborhood environments support healthy eating and physical activity there is a lower proportion of obese children. More studies need to be conducted focusing on the neighborhood's effect on childhood obesity, and these studies should consist of larger groups.



## Where are all the women journalists? The unequal representation of women in newsrooms

**Angelica Gomez**

Journalism

**Mentor:** Mary McCrank, MA

Throughout history, society has pushed a male-dominated work sphere, and this is shown throughout the many different occupations of today's society. One of those occupations is the field of journalism, the main goal of which is to gather and report news that impacts society. Yet, throughout the years, the percentage of women in newsrooms has been significantly lower than men. This is common in both entry-level and high-level jobs. So, the purpose of my research is to figure out why that is and why women are unable to break the glass ceiling to obtain leadership positions. To do this, I conducted online research to obtain academic articles and other research reports conducted by organizations focused on women in the media. What this research allowed me to do is obtain a history of journalism and statistics to objectively determine my research question. From the data I collected from my online research, it became clear that women have been unequally represented in newsrooms throughout the years.

According to Suzanne Franks, academic journalism first started out in 1908 at the University of Missouri, where women made up only 15% of the first class before gradually becoming the majority in classrooms, thus allowing them to obtain bachelor's and master's degrees in staggering numbers compared to men. This continued for more than 30 years, states Anna Griffin in her 2014 article, *Where are the women? Why we need more female newsrooms leaders*. In 2014 alone, 62.5% of women graduated with a bachelor's degree in communications compared to 37.5% of men. The numbers continue in a similar path for a

master's degree with women making up 67.6% of graduates compared to 32.4% of male graduates. So, if women are the majority of graduates, the question arises, "Why isn't the same being shown in newsrooms?"

Instead, according to the *Women's Media Center's* 2015 status report, women make up only about 37% of newsrooms' bylines. And while women and men may enter the field in almost equal numbers, the number of women journalists with more than 20 years of experience in the field continues on to be only one-third of newsrooms. The reason why women are dropping out of the field is the bigger question. The main reason for this, Griffin states, is journalism is hard with irregular and intense hours, which makes it hard to balance work and family life. This is especially true for women, since they are still expected to do the bulk of childrearing and household work. Second is the pay gap, since a woman's salary is still considerably lower than a man's. Third, women are less likely to advance in the field since they typically write soft news, such as fashion, health and education, which allows for more flexibility. Hard news beats, such as politics, is deemed more important by newsroom managers and is a path that allows reporters to advance in their companies. Lastly, society still holds gender expectations on women. For example, "some qualities women are criticized for are seen as positive attributes in men" (Griffin).

So, in conclusion, while my research shows a high number of women graduating with journalism degrees, they still have a long way to go to gain



## Sociological Factors and their Effects on Health: An Analysis of Race & Socioeconomic Status

**Jianna Howard**

Kinesiology, Sport Studies, and Physical Education

**Mentor:** Ronald Mower, PhD

This study looks into the roles race and socioeconomic status play in determining the overall health/fitness status of minorities living in American urban settings. Different disciplines of study were explored to examine how these factors influence both overall health status as well as socially constructed societal norms regarding race and the sport world.

People cannot help the circumstances in which they are born; they include but are not limited to race and socioeconomic status. Although race is a sociologically constructed way of categorizing people according to physical traits, it has resulted in vast differences in average household incomes (socioeconomic status) and poor communities populated with specific racial groups. A surge of unhealthy resources (i.e. corner stores and smoke shops) lead to higher rates of non-communicable diseases among minorities in urban neighborhoods and affect the choices people make in regards to physical activity, thus resulting in stereotypes based on race and sports.

An in-depth search of The College at Brockport's library databases resulted in a collection of articles from authors in all different disciplines including scientists, health professionals, and sociologists. Much of the reviewed literature contained sources to more information.

Studies included connecting household income to living situations and amount of physical activity, correlations between race and specific sports, and different factors that place burdens on specific aspects of health. Socioeconomic status and neighborhood safety were related to mental health in an article published by the *American Journal of*

*Public Health*. It was concluded that socioeconomic status definitely plays a role in regard to mental health, and that neighborhood safety and physical activity are often affected by household income and can lead to poor mental and overall health (Meyer, Castro-Schilo, & Aguilar-Gaxiola, 2014).

Other articles discussed sport stereotypes, their origins, and implications. The historical misconceptions and oversimplified images about black men and swimming and how these factors influence the lives of black men is discussed in "The (End)angered Black Male Swimming Against the Current," an article written by Talmadge Guy in 2014.

Although studies were done from different perspectives and in different disciplines, authors agree that race has an influence on socioeconomic status which in turn has an effect on health and the sport world.

More literature will be reviewed to understand the different perspectives on these issues. A qualitative research study will involve interviews with residents, former residents, and people employed in Rochester, NY, a city with a high minority population and a significantly higher minority population than its surrounding suburbs, to gain a better understanding of these issues. The goal of this research is to gain further information relating to the research question, "How does racial grouping affect socioeconomic status; and how does socioeconomic status affect the nutrition and physical activity choices of minorities living in urban settings?" We hope the results will lead to an open dialogue between those who face them and those in power who can effect progressive change.



## Patwa is a Language: No Ifs, Buts, or Maybes

Rashana Vikara Lydner

French and Spanish

**Mentors:** Andrea Parada, PhD, and Ewelina Barski, PhD

Jamaica has a population of over 2.6 million with over 3 million people worldwide who speak the Island's Creole (Lewis, Simons, and Fennig, 2016). Is Island's Creole, locally known as Patwa, a language? Linguistically speaking, the Jamaican Creole is seen as a language. However, culturally there are many misconceptions about the status and importance of the language.

This research focuses on a linguistic analysis of the Jamaican Creole. Firstly it emphasises the diachronic linguistic aspects of the language, examining the origins of the language. British English played a very influential part in the development of the Jamaican Creole as well as the Niger-Congo Languages from West Africa. One sees how historically intertwined the Creole is with the context of slavery and the formation of other Creole languages across the colonial world.

Secondly, examining the Creole's grammar plays an enormous part in providing concrete evidence of the evolution of the language, its divergence from British English and transference of some grammatical structures from the dominant Niger-Congo sect of languages, the Akan group (Twi). This shows the structural uniqueness of the language and its distinction from the Jamaican Standard English and British English.

Thirdly, this research takes into consideration the sociolinguistic nature of the Jamaican Creole; how it is perceived by its speakers and its status in society. Jamaican Creole does not have an official status in the country; however, most Jamaicans do speak it. The Jamaican Creole has no rights in

any public institution that relates to the state and the lives of citizens, which includes the judicial system, public health care institutions, and schools (Kouwenberg, 2011). Interestingly enough, the Jamaican Creole is present in all of these areas. It is more commonly used than the Jamaican Standard English because it is the language in which most have full competency. Even though it may not be officially recognized, one can see that it is socially acceptable as a form of communication amongst most individuals.

This research calls for Jamaicans to challenge their current assumptions about Patwa, hopefully fostering more positive attitudes towards the language. By understanding the difference between Patois and the Jamaican Creole (locally known as Patwa) and identifying the negative stereotypes associated with the language, one will be able to start promoting a better understanding of the language. Using the information about the colonial history of the language and its historical prejudices that formed during the aftermath of decolonization and the grammatical evidence that shows its distinction from British English, one will be able to show Jamaicans why they consider their Creole to be a form of broken English rather than what it actually is, a language.

The purpose of this research is to give Jamaicans an adequate explanation to why it is important to preserve and respect their own nation's language, in essence promoting the belief that, Patwa is a language, no ifs, buts, or maybes.



## Black Female Politicians Matter

### Sidnee McDonald

African & African American Studies and Political Science,  
Minor in Women & Gender Studies

**Mentor:** Rev. Yulanda McKinney, MA, MTS

On December 20, 1964, political activist Fannie Lou Hamer delivered a speech with Malcom X at the Williams Institutional CME Church, in Harlem, New York. Hamer states, "And I've been tired so long, now I am sick and tired of being sick and tired, and we want a change" (Hamer, 1964). Hamer was explaining how she was tired of being excluded and restricted from political involvement in her nation because of her race and gender. Almost 52 years after Hamer's speech, political parties along with local, federal, and state governments are continuing to limit and exclude black women from advancing in government.

This project is conducted by a literature review on the historical involvement of black women in politics and qualitative data on black women who are and have held office in New York State. Out of the 219 state legislators in the 2016 New York State Legislature, there are only 19 black female legislators. Black female legislators therefore make up a mere eight percent of the total legislative body. Clearly, black female politicians are under-represented. This study hopes to provide more light on this issue and thus to help increase the number of black women holding governmental positions.

In 2015, Rutgers University conducted a study entitled, "The Status of Black Women in American Politics." The report helped provide quantitative data to support a wide-known belief in the underrepresentation of black women in government. The report states, "Black women's voices are the most likely to be overlooked in

governmental policy-making" (Dittmar, 2015). Black female legislators are in the minority which means their vote/voice has a minimal impact on what bills are passed, and this affects how policies that are intended to impact "all women" to bring gender equality, actually affect black women.

For instance, in 1963 President Kennedy signed the Equal Pay Act, which aimed to ban wage disparities based on gender; it was passed to ensure equal pay for all women. This was a historical accomplishment, however, not all women equally benefited; the Civil Rights Act had to pass in 1964 before black women and all women of color could also benefit from the Equal Pay Act. And even nowadays, black women in New York State earn roughly \$20,000 less than white men (New York Women and the Wage Gap, 2016). At the same time, the average woman in New York State earns roughly \$7,000 less than white men. Thus, the wage gap between black women and white men is three times greater than the average wage gap of women to white men. This highlights how historically black women have not equally benefited from legislation that promotes gender equality because the legislators making these laws are not ensuring that "all women" benefit equally.

There is a lack of policy-making that specifically targets improving the lives of black female New Yorkers; instead they are included with the masses and become forgotten. I hope to continue my research and discover ways to increase the number of black female politicians.



## The Long Term Effect of Consistent Exercise Without Use of Protein Supplements with Slow Resistance Training for Muscle Growth

**Adebayo Oluyole**

Health Science

**Mentor:** Adramein Lopez, MPE

Various studies have examined the short term effect of whey protein use and resistance training separately for reshaping body composition; however, the long term effect of non-use of whey protein combined with consistent resistance training are limited. This project examines the hypothesis that whey protein is not needed to stimulate muscle growth. Research shows that most whey protein powdered supplementation are not even FDA approved. The initial idea of the project was to educate the public about the misconceptions of whey protein. Additionally, the project looked to educate the public about the importance of consuming more whole foods for muscle growth, as opposed to relying on the use of whey protein.

This research involved a self-study of non-use of whey protein powder supplementation paired with consistent resistance training to gather data and results. The procedure method used throughout this project is a combination of qualitative approach and quantitative approach. Body composition, strength level, weight, and body fat percentage were all recorded prior to the initial start of the program. Using myself as the test subject over the course of seven weeks, I recorded changes in my body fat percentage, body composition, strength level, and weight. Within the seven-week time period

a consistent diet of approximately 5000 calories a day, including the consumption of about 170 grams of protein a day was most important in the research because accurate diet makes a difference between improvement and plateau changes of the body. Finally, I noted my new body fat percentage, body composition, weight, and strength level in order to show the public the significant gains I accomplished without using any form of whey protein.

As a result of not using whey protein I was free of side effects such as increased bowel movements, nausea, bloating, cramps, reduced appetite, and fatigue. I felt more clean because I relied more on whole foods to fuel my muscles as opposed to whey protein. Though results may vary depending on everyone's individual muscle fiber type, significant gains can still be made.

The contributions of this project are aimed towards the American public. I hope data gained from this project, in addition to the qualitative findings, will promote the public to think about discontinuing the use of whey protein or to gain more knowledge about what kind of nutrients they are putting into their bodies. Furthermore, the benefits of taking a more natural approach in working out and gaining muscle can be more efficient for the body.



## Cell Phones, Attention, Mindfulness, and Psychological Outcomes

**Adwoa Opoku-Nsiah**

Psychology

**Mentor:** Melissa M. Brown, PhD

The purpose of this study was to explore the effects of cell phone usage on an individual's attention. Mindfulness is defined as bringing one's complete attention to experiences in the present moment in a non-judgmental way. Buddhist tradition holds that meditation cultivates mindfulness which promotes psychological well-being. Research indicates mindfulness can be positively correlated with well-being and negatively with negative mood states. Additionally, it has been found that meditation practices predicted both mindfulness levels and well-being, with mindfulness mediating the relationship between meditation and well-being. There are two broad categories of meditation, both of which lead to mindfulness. Focused attention meditation requires focusing one's attention narrowly on a mantra or one's breathing. Open monitoring involves being fully aware of all feelings and sensations in the present moment. Meditation and mindfulness have been associated with a variety of physiological and executive functions.

Three independent networks of attention are studied in this project. Alerting is defined as achieving and maintaining a vigilant or alert state of preparedness. Orienting regulates and limits attention to a subset of sensory inputs. Lastly, executive attention prioritizes among competing thoughts, feelings and responses. Previous research indicated an association between mindfulness meditations and enhanced attentional processes, most reliably executive attention.

According to Yen and Smetaniuk, if an activity that strengthens attentional processes increases mindfulness, it is also likely that activity that removes one from the present moment shreds attentional processes and has a deleterious effect on mindfulness and consequently mood and wellbeing. Cell phone dependence seems a likely candidate because other research has found that excessive cell phone usage in adolescents and young adults has been linked to depressed mood states. This project included 95 Introduction to Psychology students. Participants were administered a series of questionnaires and a computerized assessment of attention. This current project tests a model including cell phones, attention, mindfulness, and psychological outcomes.

The model yields five hypotheses. 1) Mindfulness will predict psychological outcomes, consistent with previous findings. 2) Cell phone dependence and cell phone activities will be associated with decreased attentional efficiency and mindfulness. 3) Attention will mediate the relationship between cell phone dependence and mindfulness. 4) Cell phone dependence and activities will be associated with poor psychological outcomes. 5) Attention will mediate the relationship between poor psychological outcomes and cell phone activities and dependence. This research is important because cell phones are a huge part of the way we live, and we need a way to combat the negative effects that comes with them.



## College and career readiness for African American Students

**Delasia Rice**

Psychology and African & African American Studies

**Mentor:** Michael Boston, PhD

The purpose of this research is to explore different ways to prepare African American students for college and future careers. The term college and career readiness is usually applied when a high school graduate has acquired the skills and knowledge in English and mathematics necessary to qualify for and succeed in higher education or job training. However, through this research, college and career readiness can be defined more deeply. Along with the skills in English and mathematics, it is important for a high school student to graduate with the necessary skills in critical thinking, creative problem solving, collaborative work, risk-taking and much more. Students should be learning these skills before they enter college and their careers.

This is important because although larger numbers of African American students are entering colleges, their retention and graduation rates are still relatively low; one reason could be that they are not being adequately prepared for the rigorous coursework and social aspects that colleges require. It is important to look at what can be done to prepare African American students in prior school years (grades K-12) so they are prepared and ready to take on the work of college and their future careers. This project is conducted by an overview of literature that describes college and career readiness as well as how this relates to African American students and the level of their preparedness when it comes to college (i.e. test scores and more). We are also analyzing programs that are partnering with local colleges

and universities to help these students prepare for colleges in ways that their schools are not.

This research examined and compared three programs whose main goal is to prepare African American and other underrepresented youth for college; we then came up with similarities that occur that allow these programs to be successful and help African American students be successful. The three programs include Upward Bound, Talent Search Program, and the College Advising Corps. They all include mentoring between the students and college students and professionals, family support, cultural enrichment and tutoring.

Although this research is ongoing, from what we have found so far, having schools partner with colleges and universities is important for African American students because they are able to see college as an option and see themselves in college (positive representation). It also gives them the support that they may not be receiving from home or schools.

Eventually we hope to conduct informational interviews and observations on college and career readiness programs for African American students. With this ongoing research we hope to provide a better understanding of how programs like Upward Bound are important and why more need to exist to prepare African American and other underrepresented students for college and future careers. We also hope to find ways how college and career readiness can be included in schools and how communities can help.



## Australia, Colombia, and the United States: An International Comparison of Forensic Science

**Iliana Ruiz**

Chemistry

**Mentor:** Ann Bunch, PhD, D-ABFA

Forensic science is the analysis and comparison of evidence which is later used in the criminal or civil law. This research will compare the forensic services offered in three countries: Australia, Colombia, and the United States. The research itself aims to determine which forensic service is the most effective and systematic in the collection of evidence. Future direction for this research questions if effective forensic services can be applied to other countries to enhance their forensic system and methods. Information for this research will be qualitative information gathered from books and articles.

Australia has a total of nine jurisdictions; the forensic science services and governance varies in each of these jurisdictions. Police in all regions are trained in the field and are responsible for collecting fingerprints, shoes or tool impressions, ballistic examination, and crime scene investigation. Health and justice and police departments provide help in DNA, documents, drugs, digital evidence, and criminalistics. Medical forensic services are provided by the health and justice departments. Some of the jurisdictions have successfully gained accreditation from the American Society of Crime Laboratory Directors' (ASCLAD). Moreover, Australia has established the National Association of Testing Authorities or NATA which tests the accuracy of a quality system.

In Colombia, forensic laboratories are dependent on the Attorney General's office and the National Police, which is part of the National Institute of Legal Medicine and Forensic Science. The institute itself is the center of all forensic related issues. The main objective of the institution

is to ensure forensic services are as organized and direct as possible. The institution has two divisions: one division focuses on the forensic services such as forensic pathology and forensic laboratories. The second division deals with forensic scientific research and legal medicine. The National Accreditation agency of Colombia (ONAC), established in 2013, aims to analyze how valid lab results are and determines if each lab demonstrates some type of management system.

The largest accreditation body in the US is the American Society of Crime Laboratory Directors' Laboratory Accreditation Board (ASCLD/LAB). One of their goals is to ensure analysts are educated and trained to deal with lab equipment and evidence. They also require a proficiency test in each lab, which provides the board with quality assurance. During the accreditation process, it is required for accreditors to review randomly selected case files and notes from various years. This is to make sure the lab that is being accredited follows the written procedures and the ASCLD standards.

Analyzing each country's forensic services shows that Australia, when compared to the US and Colombia, has the most efficient and organized forensic system. This conclusion was drawn through inspecting how accreditation is granted in labs in each country. Although the United States has the most rigorous process, Australia has the most systematic, and along with programs that, aside from accreditation, test how accurate quality control is in a lab. Colombia's forensic services have much growing to do when it comes to certain forensic policies and protocols.



## Are Urban Parents Contributing to Their Children's Achievement Gap?

**Cheryl Sampson**

Anthropology

**Mentor:** Pilapa Esara Carroll, PhD

There is much debate over the purpose of the educational system in this country – or any country, for that matter. For the purpose of my work, I use the definition that says the educational system is the mechanism for preparing citizens for life, work and citizenship, with the ultimate purpose to create a populace with a shared knowledgebase. When you look at the learning outcomes of students in urban versus suburban school districts, one continues to see that the achievement gap between these students continues to widen.

In New York State, attendance, state test scores and the on-time graduation rate are measures used to track the health of a district. In the Rochester City School District, in the 2014-2015 school year, 28% of the approximately 30,000 students missed more than ten percent of the school year – making them “chronically absent.” The results of the 2015 State ELA and Math exams show that more students have failed these exams when compared to the overall state results. At 43%, the 2014 on-time graduation rate was lower than the state average. While there are many factors that contribute to these failing numbers, this project explores how an urban child’s school attendance is related to parental decision-making. Drawing upon the work of Pierre Bourdieu, the causes of the urban-suburban achievement gap may be attributed to cultural values and social norms passed down from generation to generation – defined as “cultural capital.”

Drawing on personal experience, informal observations as well as a case study of a parent with two children in the Rochester City School District, I identified specific cultural capital characteristics. Then I determined which, if any, contributed to circumstances that would cause the parent to choose not to send their child to school in any given day.

Using qualitative data analysis techniques, the findings indicate that, while most parents place a high value on education, those with a higher degree of cultural capital have children that are not chronically absent from school. These parents tend to participate in activities with their children including visiting museums and libraries. The families are aligned with institutions such as religious organizations and they have some type of educational certification or degree. Additionally they are able to draw from lifestyle habits passed down from generation to generation – whether directly stated or observed. These are elements that Bourdieu identifies as artifacts, institutions and embedded capital, respectively.

The sample size in this study is small, but it is worth further study to understand the implications on not only this particular district, but also other urban districts. New ways of thinking about education must be developed because the current system feeds both the pool of under skilled workers and the kindergarten to prison pipeline.



## The Effects of Gastrointestinal Motility on the Enteric Microbiota within Zebrafish

**Ashley White**

Biological Science

**Mentor: Michel Pelletier, PhD**

This research is a collaborative effort between the laboratories of Dr. Michel Pelletier and Dr. Adam Rich. It utilizes the zebrafish as a model organism for human gastrointestinal (GI) motility. This model organism is advantageous due to their embryos being transparent allowing for direct observation of organ development. The kit genes within the zebrafish are orthologues of the kit gene present within humans. This gene codes for the kit receptor tyrosine kinase and its function contributes to the development and maintenance of interstitial cells of Cajal (ICC) that are required for coordinated motility patterns within the GI tract. A correlation has been found between kit mutations that result in loss of function and the loss of ICC and coordinated motility patterns in both humans and mice. The results of this research could potentially allow for development of new treatments for GI motility disorders in humans.

The research I have conducted involves a comparison of microbiota present within two strains of zebrafish: a wild type and sparse mutant strain. The wild type strain is heterozygous for kit genes a and b whereas the sparse mutant lacks a copy of kita. Previous research has shown that the kit genes are involved in GI motility, and the sparse mutant was found to exhibit a disruption in normal motility patterns. The purpose of this research is to identify and compare the microbiota in each strain and decipher whether it may contribute either negatively or positively to the pattern of motility.

I hypothesize that the sparse mutant may contain different microbiota than that of the wildtype due to the uncoordinated pattern of motility.

This experiment was conducted by isolation of the intestinal contents of six fish samples, three of which were wildtype and three sparse mutants. A solution of each of the contents were plated and grown on both rich medium (BHI) and a medium selective for enteric bacteria (EMB) and observed for the quantity and characteristics of colonies. Identification of each unique colony was then conducted through numerous biochemical tests and amplification and sequencing of 16s rDNA from isolated genomic DNA.

Through initial observation of colony growth, it was found that there was a significantly greater amount of growth seen on the sparse plates in comparison to the wild type which could ultimately support a correlation within my hypothesis. After further completion of biochemical testing, five of the twelve microbiota species sampled were identified. These species are as follows, *Sphingomonas paucimobilis*, *Vibrio ichthyenteri*, *Providencia sp.*, and two of which are *Providencia stuartii*, all of which are confirmed to be associated with fish. For those species that have not been identified further testing will be required as well as complete sequencing of their 16s rDNA. An additional trial set will also be repeated/conducted in the Fall 2016 semester in order to support and confirm that the results are accurate.



## Convicted by a Hair

**Bria Wilkins**

Chemistry

**Mentor:** Ann Bunch, PhD, D-ABFA

Edmond Locard, a pioneer of forensic science who is known as the “Sherlock Holmes of France,” came up with the idea that when a person comes in contact with an object or another person, a cross-transfer of materials occurs. This is known as the Locard’s exchange principle. Locard believed that every criminal can be connected to a crime by dust particles carried to or from a crime scene.

One type of evidence that can be transferred between individuals is called trace evidence. Some examples include hair, soil, gunshot residue, pollen, etc. Through scientific analysis, forensic scientists can link a suspect to a crime by the use of hair evidence. This is done by first establishing if the hair is, in fact, human or animal hair and then determining if the hair recovered compares to a known hair from a suspect. When making such a comparison a hair microscope is often used; it allows a scientist to view the questioned and known hair side by side. This allows any variations between the hairs to become observable.

A literature review on recent studies shows that many innocent people have been wrongfully convicted of a crime because of incorrect hair analysis. Thus, the goal of this research is to show how false positives in hair evidence can affect a court case negatively. This research closely reviews and examines the widespread, systematic error of exaggerated data presented under oath by hair analysts, and will also address the errors made by examiners regarding microscopic hair analysis.

According to the Federal Bureau of Investigations, at least 90 percent of trial transcripts contained incorrect statements and 26 out of 28 FBI agents and/or analyses have provided testimonies and laboratory reports with incorrect statements. Many FBI microscopic hair analysts have exaggerated the significance of their data which, in the end, had a negative impact on a prosecution case.

According to the Federal Bureau of Investigations (2015), close examinations involving hair analyses have been conducted to “help ensure the integrity of the justice system.” The FBI and the Department of Justice have decided to take a deeper look into what has been going on because of the recent exoneration of three men who were wrongfully convicted by a flaw in testimony regarding microscopic hair analysis. This research has indeed shown that there is a high need in raising awareness for how information is reported and presented in a court room. Using words such as “match” and “identical” can have an important effect on the outcome of a criminal or civil matter. According to *Strengthening Forensic Science in the United States* (2009), “laboratory reports generated as the result of a scientific analysis should be complete and thorough.” Analysts should provide sufficient information on their work, results and conclusions and should also present any uncertainties when presenting their data.



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